Preventing Accidental Infusion Of Breast Milk in Neonates

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The Institute for Safe Medication Practices (ISMP) was informed of the following scenario.

A hospitalized infant accidentally received breast milk intravenously instead of through a nasogastric (NG) tube. The infant was born with duodenal atresia (complete absence of the duodenal lumen), and surgery was necessary at birth. The procedure was successful. The NG tube was then inserted in order to provide nutrition with regular feedings of 30 mL of fortified breast milk, administered over two hours.

At the time of the event, an intravenous (IV) syringe pump for medications was located on the left side of the baby's incubator; an identical pump, used to deliver breast milk via the NG tube, was on the right. The pumps featured identical IV administration tubing.

Although it was not clear how the tubing used for breast milk was connected to the NG tube, a nurse mistakenly connected a syringe containing breast milk to the wrong line. About 10 mL of milk was infused intravenously before the problem was recognized. The baby experienced respiratory distress and seizures. She was treated supportively, recovered, and did not seem to have any lasting adverse effects. However, an infusion of nonsterile, particulate fluid such as enteral feedings or breast milk can be fatal, as it carries the risk of sepsis, diffuse intravascular coagulation, or emboli to major organs, which can lead to organ damage and pulmonary embolism.

A review of the literature reveals cases of inadvertent IV administration of breast milk reported as early as 1972.[1] As this case demonstrates, this error is still happening despite recognition of the problem more than three decades ago.

Ryan et al.[2] reported a similar case and noted that neonatal health professionals communicated eight previously unknown events to the authors after they posted a question about accidental milk infusion to an online e-mail discussion group.

All hospital staff—particularly workers in neonatal units—must take the risk of misconnections seriously and should take steps to eliminate all chances of IV infusion or direct injection of nonsterile, particulate fluids meant for enteral administration. A Joint Commission alert on tubing misconnections provided several excellent recommendations for preventing such tragedies:[3]

- tracing the tubing to the point of origin before any connections or reconnections are made
- rechecking connections and tracing all patient tubes and catheters to their sources upon transfer to a new setting
- labeling tubes and administration sets

However, as was emphasized by the ISMP as well as in the Joint Commission's alert, the best chance of eliminating the risk of injecting enteral solutions intravenously is to use an oral syringe, which is incompatible with IV tubing.

Enteral pumps for adults cannot deliver feedings in the small amounts necessary for premature infants.[4] Thus, as in the scenario previously described, staff members in neonatal and pediatric intensive-care units sometimes use off-label parenteral syringe pumps to administer breast milk enterally, although infusion rates may vary slightly from the programmed rate.[5] In these cases, syringes with standard Luer connections should be avoided and NG tubes should connect only to oral syringes via syringe extension sets. Some manufacturers offer such systems with non-Luer feeding tubes and extension sets.

For example, the Corflo Enteral Feeding System (Viasys) has an administration set, for use with a syringe pump, that should connect only to oral syringes. Unlike typical IV sets with a male Luer at the distal end, the connector at the distal end of the set is female and connects only to a proprietary male connector on the system's feeding tube, thus preventing possible connection with an IV line.

There are no IV ports on the NG tube or on the administration set. The feeding tube has a side port that allows connection of an oral syringe only. Both the administration set and feeding tube also have an orange stripe along their lengths to distinguish them from IV lines. Unless makeshift fittings are created, feedings and oral medications cannot be administered via an IV line with this tubing and an oral syringe.

Although IV administration of breast milk does not happen often, the risk of patient harm is high when it occurs. A remedy is within reach of all health care practitioners: using an anti-IV NG tube and administration set and an oral syringe.

At ISMP, we also recommend labeling the pumps as "Medication" or "Breast Milk" as well as labeling the breast milk syringes. This safety feature should become an item on the agenda in all facilities now. The mother of the child mentioned earlier wanted ISMP to advocate for immediate action before another child is injured from this potentially fatal but preventable error.

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The reports described in this column were received through the ISMP Medication Errors Reporting Program (MERP). Errors, close calls, or hazardous con-ditions may be reported on the ISMP Web site (www.ismp.org) or communicated directly to ISMP by calling 1-800-FAIL-SAFE or via e-mail at ismpinfo@ismp.org. ■